

**ANNUAL ADMINISTRATIVE REPORT (FY2001) AND  
WORK PLAN (FY 2002) FOR INVENTORIES AND VITAL SIGNS  
MONITORING**

**FY2001-FY2002**

**SOUTHERN COLORADO PLATEAU NETWORK**

***Southern Colorado Plateau Network Approval Signatures***

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Ron Hiebert, Research Coordinator, Colorado Plateau CESU  
Acting Chair, Southern Colorado Plateau Network

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Mike Britten , Natural Resources and Science  
Inventory and Monitoring Coordinator, Intermountain Region

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## **I. Overview and Objectives**

The Southern Colorado Plateau Network (SCP) includes parks and monuments that are located throughout the diverse landscapes of northern Arizona, northwestern New Mexico, southwestern Colorado, and southeastern Utah. The 19 park units in the SCP range from 166 acres to over one million acres in size. In FY2000, the network received start-up funds for inventories of vertebrates and vascular plants. With the assistance of the Colorado Plateau Cooperative Ecosystem Studies Unit (CPCESU), the SCP selected a steering committee, located subject matter experts, and began gathering existing data and information on biological resources. In a coordinated effort between the SCP and subject matter experts, existing data was reviewed and data gaps and priorities were identified. The USGS played a vital role in the initial phase of inventory development, providing subject matter experts, assistance in gathering and evaluating existing data, and coordinating the preparation of the proposal that serves as the road-map for inventory work in the SCP. During the latter part of FY2000, a network inventory and monitoring coordinator was hired. In FY2001, the SCP received funds to start inventories in parks and monuments, beginning with those identified in the planning process as high priority. Field studies were begun in 11 of the 19 parks and monuments in the SCP. Principal investigators for field studies came from the USGS and Northern Arizona University. A SCP network database manager also was hired, who shouldered responsibility for database management and GIS development. Database and GIS work is being done with the assistance of the USGS and Northern Arizona University. The CPCESU has assisted the SCP inventory program throughout the inventory process by facilitating partnerships with other agencies and academic institutions as well as negotiating reduced overhead rates (15%) for agreements with principal investigators located at universities. In FY2002, the network will receive \$150,000 start up funds from the Servicewide I&M program for initiating the monitoring program. During this year, the network will assemble and evaluate existing information, conduct meetings, and determine priorities in order to develop a plan for monitoring ecosystem health in parks and monuments of the southern Colorado Plateau.

### Objectives for Biological Inventories

1. Begin targeted field investigations to accomplish the documentation of 90% of vertebrate and vascular plant species in parks and monuments.
2. Continue to compile and evaluate existing data for each park in NPS databases (all parks)
3. Integrate existing data and new data acquired during inventory into standard network Inventory and Monitoring databases.
4. Compile and evaluate spatial data for parks and monuments and integrate inventory data into GIS formats.

### Objectives for Vital Signs Monitoring

5. Form a Board of Directors and Science Advisory Committee (SAC)
6. Acquire and summarize existing data and prepare for Vital Signs scoping meetings and workshops.
7. Incorporate ongoing NPS programs into Vital Signs Monitoring for SCP.

## **II. Accomplishments (FY2001) and Scheduled Activities (FY2002)**

### **A. Biological Inventories**

**Objective 1 – Begin targeted field investigations to accomplish the documentation of 90% of**

## **vertebrate and vascular plant species in parks and monuments.**

### *Task 1.1 – Mammal surveys*

Parks involved AZRU, BAND, CHCU, ELMA, HUTR, NAVA, PETR, SUCR, WACA, WUPA, YUHO

- FY 2001 Accomplishments: (1) An interagency agreement was established with Dr. Mike Bogan, USGS Arid Lands Biological Research Station, University of New Mexico, Albuquerque, to conduct a three-year study to determine the presence, relative abundance, and distribution of small, medium, and large mammal species in high priority SCP parks (AZRU, PETR, YUHO). Project began in FY 2001. Funding allocation: \$29k (for two-year study, 2001-2002). (2) Carnivore Workshop: Address management needs of parks on plateau for mountain lions and black bear interactions with humans. Funding allocation: \$13.8k.
- Scheduled FY 2002 Activities and Products: (1) Dr. Bogan and his team will continue visiting parks and conducting small mammal trapping from April to October of 2002. (2) Develop and sign agreement to begin mammal inventories at BAND, CHCU, ELMA. (3) A cooperative agreement with Northern Arizona University and Charles Drost of the USGS Colorado Plateau Field Station, NAU, Flagstaff, will be established for work at three Flagstaff parks (SUCR, WACA, WUPA) to begin in 2003. (4) A cooperative agreement will be completed and signed between the SCP and the Navajo Nation Fish and Wildlife Department to conduct mammal surveys at parks and monuments located within the borders of the Navajo Nation (CACH, NAVA) beginning in FY 2002.

### *Task 1.2 – Inventory of breeding, wintering, and migrating bird species*

Parks involved: AZRU, CACH, ELMA, ELMO, HUTR, PETR, SAPU, YUHO

- FY 2001 Accomplishments: (1) Developed and signed cooperative agreements with Mr. Matthew Johnson, Northern Arizona University and USGS Colorado Plateau Field Station, to conduct bird inventories. (2) Began first year of bird inventory at five high priority parks (AZRU, ELMO, PETR, SAPU, YUHO), coordinating with park resource managers. (3) Developed methods and established sampling locations in parks. (4) Coordinated with other biologists and network data manager on data fields and entry. Funding allocation: \$81k (for all three years of study, 2001-2003).
- Scheduled FY2002 Activities and Products: (1) Continue bird inventories at AZRU, ELMO, PETR, SAPU, YUHO. (2) Begin work at second priority park (ELMA) Funding allocation in FY 2001: \$26k (for all three years of study, 2002-2004). (3) Complete and sign cooperative agreement with Navajo Nation Fish and Wildlife Department to conduct bird inventories at parks and monuments located within the borders of the Navajo Nation (CACH, HUTR, NAVA).

### *Task 1.3 – Inventory of reptiles and amphibians*

Parks involved: AZRU, BAND, CACH, CHCU, ELMA, ELMO, HUTR, NAVA, PETR, SAPU, SUCR, WACA, WUPA, YUHO.

- FY2001 Accomplishments: (1) Developed and signed cooperative agreement with Ms. Erika Nowak and Mr. Trevor Persons, Northern Arizona University and USGS Colorado Plateau Field Station, to conduct reptile and amphibian inventories. (2) Began first year of three year herpetological inventories at AZRU, ELMO, PETR, SAPU, SUCR, WACA, WUPA, YUHO. (3) Developed methods and established sampling locations in parks. (4) Coordinated with other biologists and network data manager on data fields and entry. Funding allocation: \$91k (for all three years of study, 2001-2003).
- Scheduled FY 2002 Activities and Products: (1) Continue work at sites begun in 2001. (2) Begin work at BAND, CHCU, GLCA, ELMA, RABR. Funding allocation: \$54k (partial funding of

three year study, 2002-2003). (3) Develop and sign cooperative agreement with Navajo Nation Fish and Wildlife Department for herpetological inventories at CACH, HUTR, NAVA.

*Task 1.4 – Inventory of vascular plants*

Parks involved: AZRU, BAND, CACH, CHCU, ELMO, GLCA, GRCA, HUTR, MEVE, NAVA, PETR, WUPA, YUHO,

- FY 2001 Accomplishments: (1) Dr. Anne Cully, inventory and monitoring coordinator, began first year of three year plant inventories for AZRU, ELMO, PETR, YUHO. (2) Daniela Roth, botanist with the Navajo Nation Fish and Wildlife Department, Heritage Program, began inventories at HUTR, NAVA. (3) Developed and signed cooperative agreement with Dr. Tina Ayers, Biology Department, Northern Arizona University, to conduct plant inventory at CACH. Glenn Rink, graduate student, began working at CACH in 2001 on plant inventory. (4) Coordinated data fields and data entry protocols with other biologists and network data manager. Funding allocation: \$39k.
- Scheduled FY2002 Activities and Products: (1) Continue plant inventories at AZRU, CACH, ELMO, HUTR, NAVA, PETR, YUHO.

*Task 1.5 – Work with other agencies and with academic institutions to provide opportunities for students to assist with inventory studies.*

- FY 2001 Accomplishments: (1) Two students, Fran Collins and Emmalene Miller, and one faculty member, Dr. Bill Welton, from Haskell Indian Nations University in Lawrence, Kansas, assisted with the inventory, and gained experience in vegetation analyses and reptile and amphibian surveys. (2) Robin Taylor, graduate student in Botany, and Jennifer Paige, undergraduate student in Biology at Northern Arizona University, assisted with plant inventories at four parks. They provided the inventory staff with expertise and added to their experience in survey and sampling techniques. (3) The students participating in inventory studies have been introduced to the NPS and to individual parks; we hope that they will be encouraged to continue their education in natural resources and to consider careers with the NPS.

**Objective 2 – Continue to compile and evaluate existing data for each park into NPS databases (all parks).**

*Task 2.1 – Compile and evaluate existing data on vertebrates and vascular plants and enter them in a consistent format into NPSpecies, NPBib, Dataset Catalog, and compatible inventory databases.*

- FY 2001 Accomplishments: (1) Continued to collect existing data and updated NPSpecies, NPBib. (2) Visited parks to collect existing data and trained park staff in use of ProCite (to prepare data for inclusion in NPBib). (3) Reviewed and edited NPSpecies and NPBib entries. (4) Began developing and writing Data Management Plan.
- Scheduled FY2002 Activities and Products: (1) Continue to update and edit files on existing information for all parks. (2) Continue to visit parks to collect information (including observations, voucher specimens, and literature) and to train staff in use of ProCite (and eventually in use of web-based NPBib). ProCite will be used as an intermediate step until the NPBib website is fully functional and flexible. With ProCite, the network and individual parks will always have access to the most up-to-date bibliographic data, even if website is down or information is difficult to obtain. We will also work on website as our data is put online to correct errors or otherwise make modifications that cannot be handled in the national office. (3) Populate Dataset Catalog. (4) Begin herbarium study to review, update terminology, and add voucher specimens at local and regional herbaria to NPSpecies. (5) Complete Data Management Plan. (6) Continue working with the NCP and BLM through jointly funded Database Assistant to develop

compatible databases and plateau-wide bibliographic capabilities.

**Objective 3 – Integrate existing data and new data from biological inventories into standard network Inventory and Monitoring databases.**

*Task 3.1 – Hire key personnel to manage NPS databases and GIS work for the network inventories.*

- FY2001 Accomplishments: Nicole Tancreto was hired to manage NPS databases and GIS work.

*Task 3.2 – Coordinate data entry and editing of existing data on vertebrates and vascular plants and for NPSpecies, NPBib, Dataset Catalog, and tabular and spatial data from inventory studies.*

- FY 2001 Accomplishments: (1) Coordinated data entry and editing of existing data (NPSpecies, NPBib). (2) Reviewed requirements for Dataset Catalog and began to enter data.
- Scheduled FY 2002 Activities and Products: (1) Use new inventory data to update NPSpecies. (2) Work with NCP network to develop interface for digitizing legacy data sets and entering data collected in inventories.

*Task 3.3 – Adapt Database Template to SCP I & M projects.*

- FY 2001 Accomplishments: Reviewed Database Template and developed guidelines for data entry by inventory biologists.
- Scheduled FY2002 Activities and Products: (1) A Database Template will be created for the SCP inventories. (2) The Database Template will be populated with data collected by investigators. (3) Summarize and report data as needed.

**Objective 4 – Compile and evaluate spatial data for SCP parks and monuments, and integrate inventory data into GIS formats.**

*Task 4.1 – Develop GIS methods for applying stratification and sampling scheme to parks and monuments >250 ha in size.*

- FY 2001 Accomplishments: (1) Coordinated with USGS biologists and GIS specialist to develop GIS methods for distributing randomly stratified sample points. (2) Produced topographic maps of parks for 2001 field season that included sampling points for taxonomic groups. (2) Assisted inventory biologists in locating sampling points by uploading waypoints into GPS units.
- Scheduled FY 2002 Activities and Products: Produce maps for 2002 field season of parks with randomly stratified sample points for taxonomic groups.

*Task 4.2 – Compile existing GIS themes and other GIS data for all parks.*

- FY 2001 Accomplishments: (1) Acquired base GIS data themes (with metadata) for all parks. Scheduled FY 2002 Activities and Products: (1) Continue to acquire and evaluate GIS data for all parks.

*Task 4.3 – Convert existing hard copy maps to digital GIS format.*

- Scheduled FY2002 Activities and Products: The Data Manager will evaluate existing hard copy maps for their utility and feasibility to be incorporated into GIS.

*Task 4.4 – Convert and integrate biological inventory data into spatial formats.*

- FY 2001 Accomplishments: Created inventory related GIS datasets from GPS coordinates taken during 2001 field season and from randomly stratified sample point distribution.
- Scheduled FY2002 Activities and Products: Produce FGDC compliant metadata for all new inventory related spatial data sets.

## **B. Vital Signs Monitoring**

### **Objective 5 – Form a Board of Directors and Science Advisory Committee (SAC).**

#### *Task 5.1 – Form a Board of Directors (BOD).*

- Scheduled FY 2002 Activities and Products: The BOD is composed of superintendents or their assigned designee and provides overall guidance and oversight to the I & M program. A SCP BOD will be formed and the first meeting is planned for fall/winter 2002 to review the scope of work for FY 2002 and FY 2003.

#### *Task 5.2 – Develop a charter outlining the operating procedures of the Board of Directors.*

- Scheduled FY 2002 Activities and Products: A charter will be written, reviewed and approved by the Board of Directors and submitted to WASO.

#### *Task 5.3 – Form a Science Advisory Committee (SAC) to provide technical recommendations to the BOD and assist with data gathering and scoping sessions.*

- Scheduled FY 2002 Activities and Products: The SAC will be composed of resource managers, scientists familiar with the parks in the region, and I & M staff. A complete list of participants will be presented to the BOD for approval. The SAC will provide scientific, technical, and resource management expertise in the development of the Vital Signs Monitoring plan, and continue to function as an advisory body to the network during the implementation of monitoring.

### **Objective 6 – Acquire and summarize existing data and prepare for vital signs scoping workshops.**

- Scheduled FY 2002 Activities and Products: (1) The Network Monitoring Coordinator and Database Manager will review Resource Management Plans and summarize current and historical monitoring programs in the region including fire effects, threatened and endangered species, water quality, air quality, physical processes, and other resources. (2) Superintendents and resource managers will be interviewed from each park in the network to identify current and needed monitoring activities. (3) Monitoring conducted by neighboring agencies, partners, and parks will be summarized for the region. This information will provide essential background information for future scoping sessions. It is anticipated that completing this task and compiling the information into a report will take a year.

### **Objective 7 – Incorporate ongoing NPS programs into Vital Signs Monitoring for SCP.**

- Scheduled FY 2002 Activities and Products: Vegetation maps are a critical data layer needed for designing monitoring programs. Accordingly, we will evaluate the possibility of contributing to a regionwide vegetation mapping project, in order to speed up the ongoing vegetation mapping in the SCP.
- Scheduled FY 2002 Activities and Products: Incorporate plans for Water Quality Monitoring funds from the NPS Water Resources Division (in FY 2003) into Vital Signs Monitoring.

## **III. Staffing**

Anne Cully, Southern Colorado Plateau Network Inventory and Monitoring Coordinator

Nicole Tancreto, Southern Colorado Plateau Data and GIS Manager

Plateau Geohydrologist, TBA (Funded from Regional Office)

## **IV. Public Interest Highlights**

The compilation and evaluation of existing data from parks and monuments of the SCP revealed that

the biggest gaps in our knowledge for NPS sites in the region are for amphibians and reptiles. The first year of field studies at 8 parks has resulted in the addition of 94 new species added to their inventories (an average of approximately 12 per park, with a minimum of 5 and a maximum of 18 at individual parks). After preliminary analyses are done this fall and winter, we anticipate the addition of species for the other taxonomic groups, as well as new insights into the distribution of animals and plants in the region of the Colorado Plateau. The information and species presence, distribution, and abundance collected during the first inventories will aid substantially in management of natural resources and in the development of Vital Signs Monitoring plan for each park.

The SCP has been working closely with the Northern Colorado Plateau Network (NCP) to maintain compatibility in databases, inventory methods, and GIS formats. We will continue with this effort in FY 2002. We will also expand our efforts for data compatibility with the Bureau of Land Management, with whom we share a Database Assistant. In an effort to expand these cross-boundary relationships to other agencies and groups across the Colorado Plateau, the SCP and NCP (and the Colorado Plateau CESU) are sponsoring a special session at the 6<sup>th</sup> Colorado Plateau Biennial Conference, in Flagstaff, Arizona, titled "Inventory and Monitoring: Crossing the Boundaries".

## V. Reports, Publications and Presentations

Scheduled for FY 2002: Presentations at the 6<sup>th</sup> Annual Colorado Plateau Biennial Conference, November 4-8, 2002: (1) Initial results from herpetological inventories in southern Colorado Plateau National Parks, E.M. Nowak, T.B. Persons, S.C. Knox. (2) Initial results from avian inventories in the southern Colorado Plateau National Parks and Monuments, M. Johnson. (3) Setting and meeting goals for biological inventory: Preliminary results on a sampling plan for plant inventories at two National monuments in the Colorado Plateau Region, A.C. Cully.

## VI. Status of Park Vital Signs Monitoring

Parks in the SCP network are in the early stages of planning their park Vital Signs Monitoring program. Because funding for the planning phase of the monitoring is not available until FY2002, scoping workshops have not taken place. However, we can indicate the status of some of the biological and non-biological inventories for the SCP that will form the basis of Vital Signs Monitoring.

Table 1. Number of SCP parks and monuments with inventories of biological and abiotic resources in progress or complete.

	Air Quality	Horizon Baseline Water Quality	Soils	Geologic Resources	Plants	Animals	Vegetatio n Mapping
<b>No. SCP Parks with Inventories Complete/ In Progress</b>	0/19	18/1	2/9	0/6	6/13	3/16	0/6

## VII. Budget

Budget Narrative: In FY 2000, the network received \$70,000 from the NPS Servicewide I&M program for assessing the needs and developing a study plan for biological inventories. These funds were allocated towards obtaining subject expert review, workshops to bring together experts and NPS resource managers, developing the proposal/study plan, and hiring the Inventory and Monitoring

Coordinator. In FY 2001, the SCP network received \$444,403 From the Servicewide I&M program for biological inventories (the large amount was used to fund some studies for multiple years), for birds, mammals, plants, reptiles, and amphibians. The amount spent outside of the NPS was \$28,865 for federal outsourcing (primarily to USGS) and approximately \$329,404 for non-federal outsourcing (primarily to Northern Arizona University).

In FY 2002, the network will receive \$255,150 from the NPS Servicewide I&M program for biological inventories. These funds will be used continue the bird, mammal, plant, reptile, and amphibian inventories, as well as the data management and coordination. In addition, the network will receive \$150,000 startup funds for the vital signs monitoring program. Part of salary expenditures will be shifted from inventory to monitoring funds, to enable the highest priority unfunded inventory projects to be restored. The coordinator and data manager will provide these functions for both the inventory and monitoring programs initially; if additional staffing needs become apparent during planning, positions will be developed and filled. We have allocated monitoring funds towards speeding up vegetation mapping to be used as a basis for monitoring plans. These funds may be enhanced by money from other programs or agencies. In addition, we have allocated funds for cooperation with experts in agencies or institutions in developing monitoring plans for biotic or abiotic resources in which our staff does not have expertise. If the SCP Steering Committee sees fit, these allocations may be shifted to other priorities. An alternative could be to provide additional funding for succeeding years for the reptile and amphibian inventories at ELMA, GLCA, RABR, and for the herbarium study for all parks (see Objective 1, Task 1.3 and Objective 2, Task 2.1).

The SCP network has received in-kind services from USGS Colorado Plateau Field Station, in the form of housing for the Data/GIS manager, the use of equipment, hardware and software; and from Northern Arizona University, in the form of office space, equipment, and office assistance. In FY 2002, we have been assigned additional office and laboratory space. We have also shared a jointly funded Database Assistant with the BLM. Northern Arizona University and Haskell Indian Nations University have been a source of student assistance, providing assistance for the inventory and experience in parks and monuments for aspiring natural resource biologists and managers. We look forward to continuing these beneficial relationships in FY 2002.

Southern Colorado Plateau Network parks have made commitments of funding from other sources as well as staff time to projects related to inventory and monitoring. Parks have developed in-kind and matching funding for many projects that are vital to natural resource management. We have provided information about related projects for three parks, one large (MEVE) and two small (HUTR and YUHO) units in the attached tables. These examples indicate the commitment of SCP parks to natural resources and their management. The inventory and monitoring program provides much needed funding to SCP parks to acquire biological information and to establish monitoring for vital biological and abiotic ecosystem elements.

The Vital Signs Monitoring: Vision and Implementation Plan identified seven recommended steps for developing a monitoring program:

1. Form a network Board of Directors and Science Advisory Committee.
2. Summarize existing data and understanding.
3. Prepare for and hold a scoping workshop.
4. Write a report on the workshop and have it widely reviewed.



5. Hold meetings to decide on priorities and implementation approaches.
6. Draft the monitoring strategy.
7. Have the monitoring strategy reviewed and approved.

Priorities for FY2002 establishing a Board of Directors and a Science Advisory Committee, and beginning to summarize data for vital signs scoping sessions. We plan on having the Vital Signs Monitoring plan drafted, reviewed, revised and approved during FY 2002.